

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (currently amended) A method for solving packing and component layout problems, comprising:

performing a pattern based search on a computer by successively generating a plurality of new component configurations by applying a plurality of moves and evaluating an objective function at each of said plurality of new configurations until a final configuration is selected and output, and wherein a criterion other than the size of the move is used to determine the order in which the moves are applied, and

~~outputting a component layout resulting from said pattern based search, said method characterized by driving said pattern based search with a metric other than step size.~~

2. (currently amended) The method of claim 1 wherein the ~~metric for driving the search~~ criterion for selecting the move to be applied is based on ~~[[a]]~~ an amount of change in value of an said objective function, with that move expected to cause the greatest amount of change in value of the objective function being selected next .

3. (cancelled)

4. (currently amended) A method for solving packing and component layout problems, comprising:

determining the effect of a plurality of moves on a set of components;

organizing said plurality of moves into sensitivity groups according to the effect the moves have on said set of components;

~~performing a pattern based search on a computer in response to said determining; and~~

~~outputting a component layout resulting from said pattern based search.~~

selecting a sensitivity group;

picking one move from said set of moves in said selected sensitivity group and applying said move to a saved configuration of components;

evaluating a new configuration resulting from applying said move, and if said new configuration is improved, saving said new configuration, if said new configuration is not improved, discarding said new configuration;

continuing until no moves from said set of moves from said selected sensitivity group result in an improved configuration; and

determining if more sensitivity groups are available, and if no, outputting said saved configuration, and if yes, returning to said selecting a sensitivity group step.

5. (currently amended) The method of claim 4 wherein said determining the effect includes ranking each of said plurality of moves based on an amount of ~~the~~ change each move is expected to have ~~has~~ on an objective function and wherein said organizing includes ordering said moves from highest to lowest ranking.

6. (original) The method of claim 5 wherein said ranking includes one of analytically, probabilistically and heuristically ranking.

7. (currently amended) The method of claim 5 wherein said determining the effect additionally comprises dividing the range between highest and lowest rankings into a plurality of intervals, and wherein said organizing includes assigning each of the moves to one of said intervals.

8. (previously presented) The method of claim 7 wherein said assigning is performed according to one of a geometric progression based on said rankings and said rankings themselves.

9. (currently amended) The method of claim 4 wherein said determining the effect includes deriving a function that quantifies the effect each move has on the change ~~relates moves to changes~~ in an objective function.

10. (currently amended) The method of claim 4 wherein said determining the effect includes determining the non-intersecting volume between an object and itself after applying a move.

11. (currently amended) A method for determining sensitivity for use in solving packing and component layout problems, comprising:

ranking each of a plurality of moves on a set of components based on the effect each move is expected to have ~~has~~ on an objective function; and

storing the ranking for use in ordering the moves within a computer program for performing a pattern based search from those moves having the highest ranking to those moves having the lowest ranking.

12. (original) The method of claim 11 wherein said ranking includes one of analytically, probabilistically and heuristically ranking.

13. (original) The method of claim 11 additionally comprising dividing the range between the maximum and minimum rankings into a plurality of intervals, and assigning each of the moves to one of said intervals.

14. (previously presented) The method of claim 13 wherein said assigning is performed according to one of a geometric progression based on said rankings and said rankings themselves.

15. (original) The method of claim 11 wherein said ranking includes determining the non-intersecting volume between an object and itself after applying a move.

16. (currently amended) A method for determining sensitivity for use in solving packing and component layout problems, comprising:

ranking each of a plurality of moves on a set of components based on the effect each move is expected to have ~~has~~ on an objective function; ~~and~~

clustering grouping said moves based on said ranking; and

storing said grouping for use in ordering the moves within a computer program for performing a pattern based search ~~into intervals based on said ranking.~~

17. (original) The method of claim 16 wherein said ranking includes one of analytically, probabilistically and heuristically ranking.

18. (original) The method of claim 16 wherein said clustering includes dividing the range between the maximum and minimum rankings into a plurality of intervals, and assigning each of the moves to one of said intervals.

19. (previously presented) The method of claim 18 wherein said assigning is performed according to one of a geometric progression based on said rankings and said rankings themselves.

20. (original) The method of claim 16 wherein said ranking includes determining the non-intersecting volume between an object and itself after applying a move.

21. (currently amended) A preprocessing method ~~for determining sensitivity~~ for use in solving packing and component layout problems, comprising:
deriving a function that relates moves to expected changes in an objective function; and
storing said function for use in organizing the moves within a computer program for performing a pattern based search in response to said function.

22. (original) The method of claim 21 wherein said deriving includes one of analytically, probabilistically and heuristically deriving.

23. (currently amended) A computer readable medium carrying an ordered set of instructions which, when executed, performs a pattern based search on a computer by successively generating a plurality of new component configurations by applying a plurality of moves and evaluating an objective function at each of said plurality of new configurations until a final configuration is selected and output, and wherein a criterion other than the size of the move is used to determine the order in which the moves are applied, and outputs a component layout resulting from said pattern based search, said method characterized by driving said pattern based search with a metric other than step size.

24. (currently amended) The device of claim 23 wherein the ~~metric for driving the search~~ criterion for selecting the move to be applied is based on [[a]] an amount of change in value of an said objective function, with the move expected to cause the greatest amount of change in value of the objective function being selected next.

25. (cancelled)

26. (currently amended) A computer readable medium carrying an ordered set of instructions which, when executed, perform a method comprising:
determining the effect of a plurality of moves on a set of components;
organizing said plurality of moves into sensitivity groups according to the effect the moves have on said set of components;
~~performing a pattern based search based on said determining; and~~
~~outputting a component layout resulting from said pattern based search.~~
selecting a sensitivity group;
picking one move from said set of moves in said selected sensitivity group and applying said move to a saved configuration of components;

evaluating a new configuration resulting from applying said move, and if said new configuration is improved, saving said new configuration, if said new configuration is not improved, discarding said new configuration;

continuing until no moves from said set of moves from said selected sensitivity group result in an improved configuration; and

determining if more sensitivity groups are available, and if no, outputting said saved configuration, and if yes, returning to said selecting a sensitivity group step.

27. (currently amended) The device of claim 26 wherein said determining the effect includes ranking each of said plurality of moves based on an amount of the change each move is expected to have ~~has~~ on an objective function and wherein said organizing includes ordering said moves from highest to lowest ranking.

28. (original) The device of claim 27 wherein said ranking includes one of analytically, probabilistically and heuristically ranking.

29. (currently amended) The device of claim 27 wherein said determining the effect additionally comprises dividing the range between highest and lowest rankings into a plurality of intervals, and wherein said organizing includes assigning each of the moves to one of said intervals.

30. (previously presented) The device of claim 29 wherein said assigning is performed according one of a geometric progression based on said rankings and said rankings themselves.

31. (currently amended) The device of claim 26 wherein said determining the effect includes deriving a function that quantifies the effect each move has on the change ~~relates moves to changes~~ in an objective function.

32. (currently amended) The device of claim 26 wherein said determining the effect includes determining the non-intersecting volume between an object and itself after applying a move.

33. (currently amended) A computer readable medium carrying an ordered set of instructions which, when executed, perform a method comprising:

ranking each of a plurality of moves on a set of components based on the effect each move is expected to have ~~has~~ on an objective function; and

storing the ranking for use in ordering the moves within a computer program for performing a pattern based search from those moves having the highest ranking to those moves having the lowest ranking.

34. (original) The device of claim 33 wherein said ranking includes one of analytically, probabilistically and heuristically ranking.

35. (original) The device of claim 33 additionally comprising dividing the range between the maximum and minimum rankings into a plurality of intervals, and assigning each of the moves to one of said intervals.

36. (currently amended) The device of claim 33 35 wherein said assigning is performed according to one of a geometric progression based on said rankings and said rankings themselves.

37. (original) The device of claim 33 wherein said ranking includes determining the non-intersecting volume between an object and itself after applying a move.

38. (currently amended) A computer readable medium carrying an ordered set of instructions which, when executed, perform a method comprising:

ranking each of a plurality of moves on a set of components based on the effect each move is expected to have ~~has~~ on an objective function; and

clustering grouping said moves based on said ranking; and
storing said grouping for use in ordering the moves within a computer program for performing a pattern based search ~~into intervals based on said ranking~~.

39. (original) The device of claim 38 wherein said ranking includes one of analytically, probabilistically and heuristically ranking.

40. (original) The device of claim 38 wherein said clustering includes dividing the range between the maximum and minimum rankings into a plurality of intervals, and assigning each of the moves to one of said intervals.

41. (previously presented) The device of claim 40 wherein said assigning is performed according to one of a geometric progression based on said rankings and said rankings themselves.

42. (original) The device of claim 38 wherein said ranking includes determining the non-intersecting volume between an object and itself after applying a move.

43. (currently amended) A computer readable medium carrying an ordered set of instructions which, when executed, perform a preprocessing method comprising:

deriving a function that relates moves to expected changes in an objective function; and
storing said function for use in organizing the moves within a computer program for
performing a pattern based search ~~in response to said function~~.

44. (original) The method of claim 43 wherein said deriving includes one of analytically,
probabilistically and heuristically deriving.